

The Role of Panoramic Radiographs in Evaluation of the Types, Locations and Characteristics of the Odontomas in Iraqi Subjects (A Retrospective Study)

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Abstract: *Purpose: The purpose of the present study was to retrospectively evaluate the role of routine radiological studies (panoramic radiographs) in diagnostic the types and localization of the odontomas in Iraqi subjects.*

Materials and Methods: The study retrospectively investigated 30 odontomas in thirty patients (23 female and 7 male). The study was performed using medical records, panoramic radiographs, and pathological reports. The patients' data gathered in this study included their age, gender, location, chief complaints at presentation.

Results: Compound odontomas were two times more common than complex odontomas. Most odontomas were found in the second decade of life and in posterior mandible for complex while anterior maxilla for compound odontomas.

Conclusion: It would be suggested that periodic panoramic examination during the first and second decade of life might be beneficial for the early detection and better prognosis for odontomas.

Keywords: *Odontomas, radiography, panoramic, compound, complex.*

Introduction

Odontomas are classified as odontogenic tumors; however, due to their limited and slow growth, they are considered to be hamartomas in which all dental tissues are represented, rather than benign neoplasm [1, 2, 3]. The etiology of the odontoma is yet not clear [4, 5]. However, it has been suggested that trauma and infection at the place of the lesion can offer ideal conditions for its appearance [6, 7]. Many authors are of opinion that odontomas are inherited or develop as a result of genetic mutation. This finding is backed by an increased number of odontomas found in heritable syndromes, such as Gardeners syndrome [5, 8]. On the basis of gross, radiographic, features, odontomas are sub-classified into compound odontoma (small tooth like structures) and complex odontoma (a conglomeration of dentin, enamel, and cementum) [1, 2, 3, 9, 10]. The complex odontomas are usually located in the posterior mandible, while compound odontomas are more often found in the anterior maxilla [8]. Similar to teeth, once fully calcified, they do not develop further, and multiple odontomas are rare [11]. Complex odontoma are less common in comparison with compound variety at 1:2 ratio [12]. An increased prevalence of these tumors is observed in children and adolescents, with little significance in relation to patient sex [13, 14]. Odontomas are generally asymptomatic, often associated with delayed eruption, or impaction of permanent teeth [15, 16, 17, 18]. There have been many studies of odontomas dealing with clinical investigations, radiographic features [13, 19, 20, 21] and case reports [22, 23].

These lesions are normally diagnosed by routine radiological features in the second and third decades of life [2, 13, 24], radiological features show that odontomas manifest as a dense radio-opaque lesion surrounded by a thin radiolucent halo corresponding to the connective tissue capsule [1, 14]. Three developmental stages can be identified, based on the radiological features and degree of calcification of the lesion at the time of diagnosis, the first stage is characterized by radiotransparency due to the absence of dental tissue calcification, the second or intermediate stage presents partial calcification, and the third or classically radiopaque stage exhibits significant calcification surrounded by a radiolucent halo [25]. Compound odontomas show an irregular radiopaque image with variations in contour and size, composed of multiple radio-opacities corresponding to the so-called denticles (mini teeth), in the complex odontoma, radio-opacity is not specific, rather, a disorganized, irregular single or multiple mass was identified [26]. Histologically, odontomas are composed of various dental tissue formations, including enamel, dentin, cementum and pulp [27]. The treatment is surgical excision followed by histopathologic study to confirm the diagnosis of odontoma [1, 14].

Materials and Methods

Thirty cases of odontomas (23 female and 7 male) were diagnosed in thirty patients. Their medical records, features on the panoramic radiographs, and pathological reports were collected from information written in each individual case. The panoramic radiographs had been acquired by (My ray CE 0051(V.B1 cooc A 14/C-IMOLA (BO)-Italy, X-ray source (85 kVp, 10 mA), The diagnoses had been confirmed by radiographic or histopathologic examination, (all complex odontomas had been confirmed by histological examination). The patients' data gathered in this study included their age, gender, location, chief complaints at presentation. According to the classification of the World Health

Organization (2005), odontomas as being of two types; complex and compound odontomas [23]. The location of the lesion in the maxilla or mandible was classified as the anterior (incisor to canine), or posterior (premolar and molar regions) (figure 1). Two oral and maxillofacial radiologists interpreted the panoramic images. Statistical analysis was performed by using SPSS statistics.

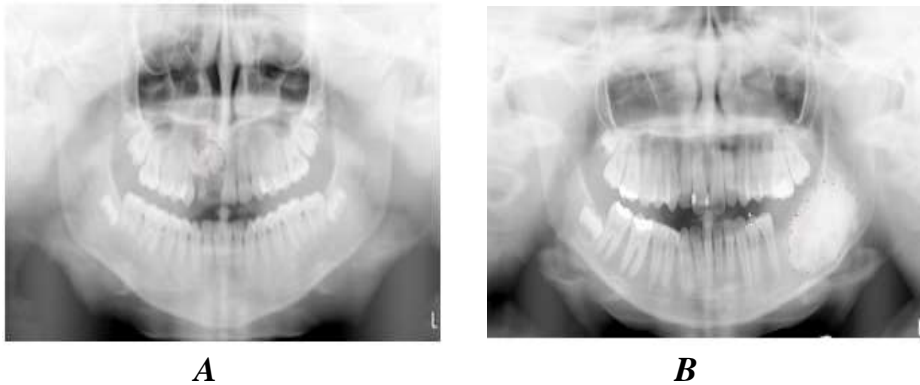


Figure (1): Panoramic radiographs show odontomas.

(A) compound odontoma in upper anterior area.(B) complex odontoma in lower left posterior area .

Results

The distribution of 30 odontoma patients' age and gender are presented in Table 1. There were 20 cases of compound odontomas and 10 cases of complex odontomas in this study. Most odontomas were found in the second decade of life. Compound odontomas were two times more common than complex odontomas. Sixteen cases (53.3 %) of 30 odontomas were detected on routine dental examinations, chi-square showed high significant differences with $P < 0.01$. Fourteen of 20 compound odontomas (70.0%) occurred in the anterior maxilla. In contrast, seven of 10 complex odontomas (70.0%) were found in the posterior mandible, chi-square (2.658) showed significant differences with ($P < 0.05$) for location of

odontom as in both maxilla and mandible (Table 1, Figure 2). Odontom as showed gender predilection that most cases in female and chi-square (14.25) showed high significant differences with ($P<0.01$) for location of odontomas in each gender (Table 1, Figure 3). Tables (2, 3) showed location of odontomas in each gender according to age for both types (complex and compound odontomas) that most odontomas were found in the second decade of life in female and in posterior mandible for complex while anterior maxilla for compound odontomas. Chi-square (9.058) showed high significant differences with ($P<0.01$) for odontomas location in each gender according to age in both types of odontomas. (Table 4).

Discussion

The term “odontoma” by definition alone means any tumour of odontogenic origin. Odontoma is considered to be the hematomas of aborted tooth development and accounts for 22% of the odontogenic tumours, the complex being rare twice as compared to compound, about 60% of complex odontomas occur in women [28]. Odontomas are benign tumors frequently seen in the oral cavity, sometimes producing no symptoms – resulting in their incidental finding during routine radiological studies, many investigators have presented similar findings [2, 6, 21, 24, 29]. Compound odontomas show a predilection for the anterior sector of the upper maxilla, while complex odontomas are typically found in the posterior mandibular region [30, 31].

In this study, most odontomas were found in the second decade of life. Compound odontomas were two times more common than complex odontomas and observed that odontomas were more affected female than male by compound or complex odontomas which in agreement with results of a study done by de Andrade Santos et al in 2012 [32]. The result of this study is in conformity with Sánchez et al. [33] which observed the same, a clear predominance of compound odontomas over complex odontomas. The opposite was reported by Alves et al. [34] who concluded that

complex odontomas were more frequent than the compound odontomas, affecting preferably the male gender the difference may depend on the sample of population and racial and partially conformed with them that the posterior region of the mandible was more affecting during study of a series of 38 odontoma cases. Odontomas may be diagnosed in patients of both genders; however, they are more frequent in women before the second decade of life. In general, they are asymptomatic and slow-growing, reaching no more than 3 cm in diameter [33], which in agreement with results of this study. In a study done by Seo-Young An et al. [35] which found that the most common locations were, respectively, the anterior region for the compound odontoma and the posterior region for the complex odontoma, which corresponded with the reports of Kulkarni et al. [18], da Costa et al. [22] and this study. In the studies of Regezi et al. [13] and Kaugars et al. [21] the most common site affected was the anterior region (incisors and canines) of the maxilla which in agreement with finding of this study. de Oliveira et al. [36] and Kodali et al. [10] emphasized the importance of routine examination using panoramic radiography for early detection of odontomas and prevention of adverse effects so these findings were in close agreement with this study. According to their result, it seems like they confirm Avsever et al. [37] which reported that the compound types of the odontomas are more common than complex odontomas and the anterior mandible is the most affected site during a study of a total of 22 odontomas in 20 patients (11 females; 9 males) (0.14%) were found of the 14,250 patients` panoramic view.

Conclusions

Periodic panoramic examination during the first and second decade of life might be beneficial for the early detection and better prognosis of odontomas.

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Table (1): Distribution of odontoma types according to age , gender and locations .

Age	Complex odontoma			Compound odontoma			Statistic	
	Male %	Female %	Total%	Male %	Female %	Total%	Chi-square	P-value
Under13	0(0.0)	0(0.0)	0(0.0)	1(5.0)	1(5.0)	2(10.0)	12.36	P<0.001 High significant
14-16	1(10.0)	2(20.0)	3(30.0)	3(15)	6(30.0)	9(45.0)		
17-19	0(0.0)	3(30.0)	3(30.0)	1(5.0)	4(20.0)	5(25.0)		
20-22	0(0.0)	2(20.0)	2(20.0)	0(0.0)	3(15)	3(15.0)		
23-25	1(10.0)	1(10.0)	2(20.0)	0(0.0)	1(5.0)	1(5.0)		
Total	2(20.0)	8(80.0)	10(100)	5(25.0)	15(75.0)	20(100)		

odontomas location according to gender	Male %	Female %	Total%	Male%	Female %	Total%	Chi-square	P-value
Posterior mandible	1(10.0)	6(60.0)	7(70.0)	1(5.0)	0(0.0)	1(5.0)	14.25	P<0.001 High significant
Posterior maxilla	0(0.0)	1(10.0)	1(10.0)	1(5.0)	2(10.0)	3(15.0)		
Anterior mandible	1(10.0)	0(0.0)	1(10.0)	0(0.0)	2(10.0)	2(10.0)		
Anterior maxilla	0(0.0)	1(10.0)	1(10.0)	3(15.0)	11(55.0)	14(70.0)		
Total	2(20.0)	8(80.0)	10(100)	5(25.0)	15(75.0)	20(100)		

odontomas according to type in both maxilla and mandible	Complex odontoma		Compound odontom		Total		Statistic	
	No.	%	No.	%	No.	%	Chi-square	P-value
Posterior mandible	7	70	1	5	8	26.7	2.658	P<0.05 Significant
Posterior maxilla	1	10	3	15	4	13.3		
Anterior mandible	1	10	2	10	3	10		
Anterior maxilla	1	10	14	70	15	50		
Total	10	33.3	20	66.7	30	100		

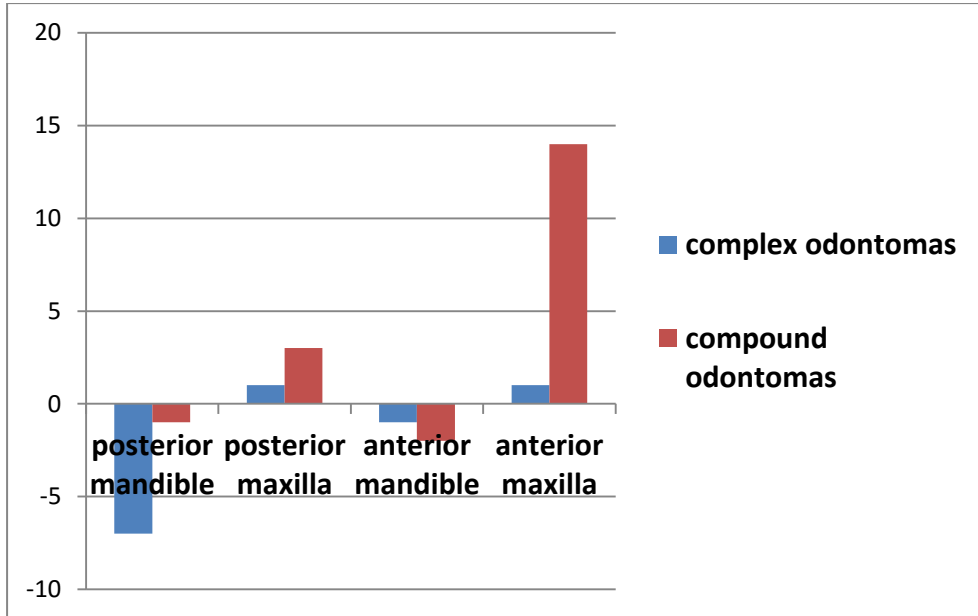


Figure (2): Location of odontomas (compound type, complex type).

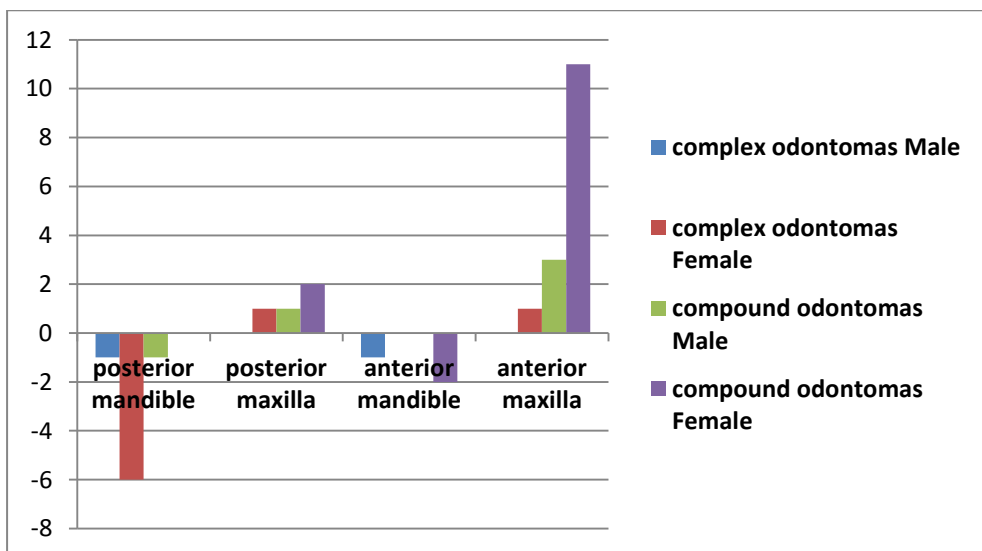


Figure (3) Location of odontomas (compound type, complex type) according to gender.

Table (2): Odontomas location in each gender according to age (complex odontoma).

	Posterior mandible		Posterior maxilla		Anterior mandible		Anterior maxilla	
	Male %	Female %	Male %	Female %	Male %	Female %	Male %	Female %
Under 13	0	0	0	0	0	0	0	0
14-16	0	1	0	1	1	0	0	0
17-19	0	2	0	0	0	0	0	1
20-22	0	2	0	0	0	0	0	0
23-25	1	1	0	0	0	0	0	0
Totale	1	6	0	1	1	0	0	1

Table (3): Odontomas location in each gender according to age (Compound odontomas).

	posterior mandible		posterior maxilla		anterior mandible		anterior maxilla	
	Male%	Female%	Male%	Female%	Male%	Female%	Male%	Female%
Under 13	0	0	0	0	0	0	1	1
14-16	1	0	0	1	0	0	2	5
17-19	0	0	1	1	0	0	0	3
20-22	0	0	0	0	0	2	0	1
23-25	0	0	0	0	0	0	0	1
Total	1	0	1	2	0	2	3	11

Table (4) : Odontomas location in each gender according to age for both types

	Posterior mandible		Posterior maxilla		Anterior mandible		Anterior maxilla	
	Male %	Female %	Male %	Female %	Male %	Female %	Male %	Female %
Under13	0	0	0	0	0	0	1	1
14-16	1	1	0	2	1	0	2	5
17-19	0	2	1	1	0	0	0	4
20-22	0	2	0	0	0	2	0	1
23-25	1	1	0	0	0	0	0	1
Totale	2	6	1	3	1	2	3	12

**chi-square=9.058 P<0.01 High significant*

دور الأشعة البانورامية في تقييم أنواع، مواقع و خصائص الاورام السنية لدى العراقيين - دراسة ارشيفية

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المستخلص:

الغرض: غرض البحث تقييم دور الأشعة الروتينية البانورامية المؤرشفة تحديدا في تشخيص انواع و مواقع الاورام السنية لدى العراقيين .

الطرق و الحالات: درست الورقة ٣٠ حالة ورم سني لدى ثلاثين مريض (٢٣ امرأة و ٧ رجال) مؤرشفة طبيا باستخدام التقارير الطبية، الأشعة و التحاليل النسيجية للحالات المرضية وتم توثيق البيانات الشخصية (عمر و جنس المريض) و موقع الورم السني بالاضافة الى طبيعة الشكوى المرضية.

النتائج: الاورام السنية البسيطة وجدت عند ضعف عدد الحالات المرضية مقارنة بالاورام السنية المعقدة معظم الحالات وجدت لدى المرضى في العقد الثاني من العمر. كان وجود الحالات المعقدة اكثر في المنطقة الخلفية في الفك الاسفل، بينما كان وجود الحالات البسيطة اكثر في المنطقة الامامية للفك الاعلى.

الاستنتاج: تقترح الدراسة اجراء مسح بالأشعة البانورامية خلال العقد الاول والثاني من العمل لفائدته المحتملة في التشخيص المبكر و بالتالي الفعالية الاشجع في العلاج.

الكلمات الرئيسية: الاورام السنية، الأشعة التشخيصية، الأشعة البانورامية، بسيطة، معقدة.